

Experience in Designing and Evaluating a Teleconsultation System Supporting Shared Care of Oncological Patients

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Abstract

This poster presents our experience in designing, developing and deploying a Web-based Teleconsultation System based on a Patient Centred Oncological Electronic Medical Record (PEMR) specifically designed to provide clinicians a cooperative work tool supporting the oncological patient management. An evaluation phase in a clinical setting was performed when the system was deployed in the hospitals. A second evaluation phase after two year of utilization has been carrying on.

Background

Cancer is a complex pathology that involves different specialists in the treatment of patients for a long time. For attempting to assess the utility of a Teleconsultation System (TS) in supporting the delivering of high quality cancer treatment to rural areas, a three-year oncological telemedicine project started in 1997 in the Province of Trento (North Italy) and concluded in 2000 [1]. The aim of the project was to design, develop and evaluate a computer based cooperative framework to support oncological patient management among clinicians belonging to different hospitals, by providing an effective tool to improve communication among them.

Methods

The system was designed and developed using a user centred approach, by which needs assessment, user interface design and rapid prototyping were conducted in strong collaboration with the oncologists. The main component is a PEMR structured as a series of HTML pages dynamically created by a Web server (Microsoft IIS) to store and retrieve the data in a relational database (Microsoft SQL 7). The PEMR can be accessed by clinicians from the departments of the hospitals through a client custom application built around a web browser (Microsoft IE). The system integrates a synchronous teleconsultation tool (STT) and an asynchronous one (ATT). STT allows for multidisciplinary distributed virtual meetings, in which clinicians belonging to different departments of different hospitals can simultaneously share and navigate the same PEMR pages and discuss on data in real time. The discussion is supported by an integrated whiteboard with drawing tools to visualize and edit diagnostic images and by a digital audio channel. ATT is a message-based tool integrated in the PEMR by which a clinician can pose patient specific questions to a consultant who can answer at a later time

having immediate access to the PEMR of the question's subject. A questionnaire-based evaluation of the users' satisfaction in using the TS was conducted in two phases six months apart to investigate the users' expected benefits versus perceived ones [2].

Results & Conclusions

TS was deployed during the last phase of the project in 2000 and it has been routinely using in the oncological activity in the involved hospitals (3000 patients managed with TS). From this project some experiences have been gained: 1) the development of a TS based on web technology has great potentialities in favouring not only inter-hospital but also territory-hospital oncological patient management (e.g. by involving GPs and district nurses), 2) as a distributed PEMR is the cornerstone of shared care and the point of reference for any exchange of medical information, teleconsultation tools have to be closely integrated with the PEMR, avoiding the necessity for clinicians to change work environment or to prepare data presentation sequences beforehand, 4) TS has to provide both synchronous and asynchronous teleconsultation modalities, the former being a powerful tool to share and discuss patient's information, the latter having much less organizational impact, 5) the adopted user centered approach allowed to design and develop a TS effectively tailored to the patient management workflow of the Oncological Department of the central hospital. However, because physicians tend to design systems implicitly embedding data, guidelines and workflow, particular attention has to be posed in developing more flexible systems in which medical and organisational knowledge is maintained well separated from data management architecture. Another critical point is the impact of the introduction of such a system in a hospital environment, particularly as regards user training and changes in the organisation. The evaluation phase showed a positive attitude of the users towards the system. Moreover, clinicians felt that both teleconsultation modalities can favour communication with colleagues for delivering a higher quality care.

References

1. Demichelis et al., "Design and implementation of a regional tele-oncology project", J Telemed Telecare Vol 6, Supp 1, 71-73, 2000
2. Larcher et al., "Analysis Of The User-Satisfaction With The Use Of A Tele-consultation System In Oncology", Special issue: Abstracts of MEDNET 2001, Technology and Health Care, Vol. 9, Nr. 6, 2001, p 497-498.